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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,587	02/24/2004	Masao Noro	308455 H8072US	3201

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EXAMINER
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PAUL, DISLER

ART UNIT	PAPER NUMBER
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2614

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/785,587	<b>Applicant(s)</b> NORO ET AL.	
	<b>Examiner</b> DISLER PAUL	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Argument***

In regard to independent claim (1) which cite the limitation as in “each of the N speakers having two terminals, one of the two terminals being coupled to a corresponding one of the N driving circuits and the other of the two terminals being connected together so that N + 1 wirings are utilized in the speaker array system” has been further analyzed and rejected over Wert, Jr. (4,382,157).

Wert, Jr. as whole, specifically disclose of each of the N speakers having two terminals, one of the two terminals being coupled to a corresponding one of the N driving circuits and the other of the two terminals being connected together so that N + 1 wirings are utilized in the speaker array system (Wert; fig.4 {(42,44); (56,58); (48,50); (52,54) and the other terminals all connected to common ground as in (46)}; col.3 line 30-34; col.4 line 1-3/N +1 wiring with other terminal connected to common ground).

Similarly, in regard to claim 13, which cite the limitation as in “N wirings which connect the signal input terminals of the N speakers to outputs of the plurality of N driving circuits, respectively; a single common wiring which connects the common terminals of the N speakers together” has been further analyzed and rejected over Wert, Jr. (4,382,157).

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8; 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,181,796, B1) and Wert, Jr. (4,382,157).

Re claim 8, Johnson disclose of a speaker array system comprising: N driving circuits, N being of an integer (fig.5 (114R, 114L) ; col.3 line 1-10/ the amplifiers as the driving circuits and wherein N as being an integer equal to two); and a plurality of N speakers arranged in an array , each of the N speakers making plural pairs of speakers (fig.5 (R,L, 118R, 118L)/array of speakers as being in pairs), each pair of speakers comprising a first speaker or a second speaker, each first speaker being position adjacent to the second speaker in the pairs of speakers (fig.5 (R,L, 118R, 118L); col.3 line 25-44/the two speakers being adjacent to the other to a common node).

However, Johnson fail to disclose of the specific wherein the N driving circuits being an integer equal to or greater than 4 and similarly having a plurality of N speakers. But, Wert, Jr. disclose of the similar concept wherein such N driving circuits being an integer equal to or greater than 4 and similarly having a plurality of N speakers (fig.4 {(42,44); (56,58); (48,50); (52,54)}; fig.5; col.1 line 55-48; col.3 line 20-50; equalize driving circuits and corresponding speakers as in 5) so as to obtain a more faithful reproduction of the sound radiation pattern while at the same time preserving the stereophonic characteristics of the sound for reproduction at opposite end of the array. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the prior art with implementing the N driving circuits being an integer equal to or greater than 4 and similarly having a plurality of N speakers so as to obtain a more faithful

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reproduction of the sound radiation pattern while at the same time preserving the stereophonic characteristics of the sound for reproduction at opposite end of the array.

The combined teaching of Johnson and Wert, Jr. as whole, further disclose of each of the N speakers having two terminals, one of the two terminals being coupled to a corresponding one of the N driving circuits and the other of the two terminals being connected together so that N + 1 wirings are utilized in the speaker array system (Wert; fig.4 {(42,44); (56,58); (48,50); (52,54) and the other terminals all connected to common ground as in (46)}; col.3 line 30-34; col.4 line 1-3/N + 1 wiring with other terminal connected to common ground) .

The combined teaching of Johnson and Wert, Jr. as a whole, further disclose of wherein in each pair of speakers, the one terminals coupled to the driving circuits have opposite polarity (Johnson; fig.3 (120, 114L); col.2 line 30-35/circuit with opposite polarity), and the first speaker receives a first driving signal at the one terminal from the corresponding one of the N driving circuits and outputs a first current signal at the other terminal (Johnson; fig.5 (218, 216); col.3 line 30-35) , and the second speaker receives a second driving signal, having an inverse phase and a predetermined delay relative to the first driving signal, at the one terminal from the corresponding one of the N driving circuits and outputs a second current signal at the other terminal so that a magnitude of a sum of the first current signal and the second current signal is determined by a magnitude of the predetermined delay (fig.5-6 (218,120); col.3 line 1-12; col.5 line 45-55; col.2 line 35-50/delay of one terminal output with respect to the other and phase inverted and net of current produced as in fig.5-6 (218); col.2 line 10-25).

RE claim 10, the speaker array system according to claim 8, wherein the inverse phase is provided by an inverting amplifier (fig.5-6(120); col.3 line 15-25).

Re claim 11, the speaker array system according to claim 8, wherein the array is a two dimensional array (fig.5; col.3 line 37-43/inherently such speaker is in at least two dimension having such a length and width dimension).

RE claim 12, the speaker array system according to claim 8, wherein the others of the two terminals connected together are connected to ground (Wert; fig.4 (46); fig.5; col.3 line 30-33; col.4 line 1-3/all of the other terminals connected to a common ground).

Re claim 13, Johnson disclose of a speaker array system comprising: a two-dimensional speaker array comprising a plurality of N speakers, N being an integer, each of the N speakers including a signal input terminal and a common terminal (fig.5 (118R, 118L ) ; col.5 line 15-20/ inherently such speakers has two dimension in term of width and length dimension and further more the speakers wherein N as being an integer equal to two; with a signal input terminal and common terminal ground (218) in fig.5) and a plurality of N driving circuits which drive the N speakers by driving signals, respectively(fig.5 (114R, 114L ) ; col.3 line 1-10/ the amplifiers as the driving circuits) .

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However, Johnson failed to disclose of the specific wherein the N speakers as being an integer equal to or greater than 4. But, Wert, Jr. disclose of the similar concept wherein the N speakers as being an integer equal to or greater than 4 (fig.4 {(34-36; 60,62)}) so as to obtain a more faithful reproduction of the sound radiation pattern while at the same time preserving the stereophonic characteristics of the sound for reproduction at opposite end of the array. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the prior art with implementing wherein the N speakers as being an integer equal to or greater than 4 so as to obtain a more faithful reproduction of the sound radiation pattern while at the same time preserving the stereophonic characteristics of the sound for reproduction at opposite end of the array.

The combined teaching of Johnson and Wert, Jr. as a whole, further disclose of such wherein N wirings which connect the signal input terminals of the N speakers to outputs of the plurality of N driving circuits, respectively and a single common wiring which connects the common terminals of the N speakers together (Wert; fig.4 {(42,44); (56,58); (48,50); (52,54) and the other terminals all connected to common ground as in (46)}; col.3 line 30-34; col.4 line 1-3/N +1 wiring with other terminal connected to common ground) .

The combined teaching of Johnson and Wert, Jr. as a whole, as modified would have further disclose of a plurality of N input terminals connected to the N driving circuits to supply input signals to the N driving circuits, respectively (Johnson; fig.5 (111R; 111L, 114R; 114L); col.5 line 35-45) ; and a plurality of inverters for inverting a signal, which inverters are

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alternately disposed between the N driving circuits and the N input terminals in such a manner that a speaker of the N Speakers which is connected to the inverter through the driving circuit is arranged physically adjacent to a speaker of the N speakers which is not connected to the inverter through the driving circuit (fig.5-6 (218,120); col.3 line 1-12; col.5 line 45-55; col.2 line 35-50/delay of one terminal output with respect to the other and phase inverted and net of current produced as in fig.5-6 (218); col.2 line 10-25) wherein the input signals which have same components, and to which predetermined delays are given, are input to the input terminals, respectively, so that a magnitude of a difference between the driving signals in the adjacent speakers is determined by a magnitude of the predetermined delay (delay of one terminal output with respect to the other and phase inverted and net of current produced as in fig.5-6 (218); col.2 line 10-25)

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,181,796,B1) and Wert, Jr. (4,382,157) and further in view of Weinreich et al. (US 6,263,083).

Re claim 9, the speaker array system according to claim 8, but the combined teaching of Johnson and Wert, Jr. as a whole, failed to disclose of the predetermined delay is used to cause an acoustic lens effect. But, Weinreich disclose of an array of speakers with predetermined delay is used to cause an acoustic lens effect (fig.3 (64)/array speakers with each driving signals with phase delay). Thus, it would have been obvious for one of the ordinary skills in the art to have modified the combination



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with the predetermined delay is used to cause an acoustic lens effect for purpose of simulating the complex directional patterns of sound anywhere in room.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISLER PAUL whose telephone number is (571)270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./

Examiner, Art Unit 2614

/Xu Mei/

Primary Examiner, Art Unit 2614